

Application No. 10/579,295

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A bi-aspherical type progressive-power lens with a progressive refractive power action dividedly allotted to a first refractive surface being an object side surface and a second refractive surface being an eyeball side surface,

wherein when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~farsightedness diopter~~ far vision diopter measurement position F1, are DHf and DVf respectively, and

on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~nearsightedness diopter~~ near vision diopter measurement position N1, are DHn and DVn respectively, relation of DHn and DVn are expressed by

$$DHf + DHn < DVf + DVn, \text{ and } DHn < DVn,$$

surface astigmatism components at F1 and N1 of the first refractive surface are offset by the second refractive surface, and a combination of the first and second refractive surfaces gives a ~~farsightedness diopter~~ far vision diopter (Df) and an addition diopter (ADD) based on prescription values, and

a distribution of astigmatism on the first refractive surface is bilaterally symmetrical with respect to one meridian passing through the ~~farsightedness diopter~~ far vision diopter measurement position F1, a distribution of astigmatism on the second refractive surface is bilaterally asymmetrical with respect to one meridian passing through a ~~farsightedness diopter~~ far vision diopter measurement position F2 of the second refractive surface, and a position of a ~~nearsightedness diopter~~ near vision diopter measurement position N2 on the second refractive surface is shifted inward to a nose by a predetermined distance.

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2. (Currently Amended) The bi-aspherical type progressive-power lens according to claim 1, wherein

a distribution of ~~transmission astigmatism~~ transmission average diopter in a near portion of the bi-aspherical type progressive-power lens is arranged such that a nose side is dense and a temple side is sparse.

3. (Currently Amended) A method of designing a bi-aspherical type progressive-power lens with a progressive refractive power action dividedly allotted to a first refractive surface being an object side surface and a second refractive surface being an eyeball side surface,

wherein when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~farsightedness diopter~~ far vision diopter measurement position F1, are DHf and DVf respectively, and

on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~nearsightedness diopter~~ near vision diopter measurement position N1, are DHn and DVn respectively, the relation of DHn and DVn is expressed by

$$DHf + DHn < DVf + DVn, \text{ and } DHn < DVn,$$

surface astigmatism components at F1 and N1 of the first refractive surface are offset by the second refractive surface, and a combination of the first and second refractive surfaces gives a ~~farsightedness diopter~~ far vision diopter (Df) and an addition diopter (ADD) based on prescription values, and

a distribution of astigmatism on the first refractive surface is bilaterally symmetrical with respect to one meridian passing through the ~~farsightedness diopter~~ far vision diopter

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measurement position F1, a distribution of astigmatism on the second refractive surface is bilaterally asymmetrical with respect to one meridian passing through a ~~farsightedness diopter~~far vision diopter measurement position F2 of the second refractive surface, and a position of a ~~nearsightedness diopter~~near vision diopter measurement position N2 on the second refractive surface is shifted inward to a nose by a predetermined distance.

4. (Currently Amended) The method of designing a bi-aspherical type progressive-power lens according to claim 3, wherein

a distribution of ~~transmission astigmatism~~transmission average diopter in a near portion of the bi-aspherical type progressive-power lens is arranged such that a nose side is dense and a temple side is sparse.

5. (Currently Amended) A bi-aspherical type progressive-power lens with a progressive refractive power action dividedly allotted to a first refractive surface being an object side surface and a second refractive surface being an eyeball side surface,

when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~farsightedness diopter~~far vision diopter measurement position F1, are DHf and DVf respectively, and

on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~nearsightedness diopter~~near vision diopter measurement position N1, are DHn and DVn respectively, the relation of DHn and DVn is expressed by

$$DHf + DHn < DVf + DVn, \text{ and } DHn < DVn,$$

surface astigmatism components at F1 and N1 of the first refractive surface are offset by the second refractive surface, and a combination of the first and second refractive surfaces

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gives a ~~farsightedness diopter~~far vision diopter (Df) and an addition diopter (ADD) based on prescription values, and

a distribution of average diopter on the first refractive surface is bilaterally symmetrical with respect to one meridian passing through the ~~farsightedness diopter~~far vision diopter measurement position F1, a distribution of average diopter on the second refractive surface is bilaterally asymmetrical with respect to one meridian passing through a ~~farsightedness diopter~~far vision diopter measurement position F2 of the second refractive surface, and a position of a ~~nearsightedness diopter~~near vision diopter measurement position N2 on the second refractive surface is shifted inward to a nose by a predetermined distance.

6. (Currently Amended) The bi-aspherical type progressive-power lens according to claim 5, wherein

a distribution of ~~transmission astigmatism~~transmission average diopter in a near portion of the bi-aspherical type progressive-power lens is arranged such that a nose side is dense and a temple side is sparse.

7. (Currently Amended) A method of designing a bi-aspherical type progressive-power lens with a progressive refractive power action dividedly allotted to a first refractive surface being an object side surface and a second refractive surface being an eyeball side surface,

wherein when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~farsightedness diopter~~far vision diopter measurement position F1, are DHf and DVf respectively, and

on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~nearsightedness diopter~~near vision diopter

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measurement position N1, are DHn and DVn respectively, the relation of DHn and DVn is expressed by

$$DHf + DHn < DVf + DVn, \text{ and } DHn < DVn,$$

surface astigmatism components at F1 and N1 of the first refractive surface are offset by the second refractive surface, and a combination of the first and second refractive surfaces gives a ~~farsightedness diopter~~ far vision diopter (Df) and an addition diopter (ADD) based on prescription values, and

a distribution of average diopter on the first refractive surface is bilaterally symmetrical with respect to one meridian passing through the ~~farsightedness diopter~~ far vision diopter measurement position F1, a distribution of average diopter on the second refractive surface is bilaterally asymmetrical with respect to one meridian passing through a ~~farsightedness diopter~~ far vision diopter measurement position F2 of the second refractive surface, and a position of a ~~nearsightedness diopter~~ near vision diopter measurement position N2 on the second refractive surface is shifted inward to a nose by a predetermined distance.

8. (Currently Amended) The method of designing a bi-aspherical type progressive-power lens according to claim 7, wherein

a distribution of ~~transmission astigmatism~~ transmission average diopter in a near portion of the bi-aspherical type progressive-power lens is arranged such that a nose side is dense and a temple side is sparse.

9. (Currently Amended) A bi-aspherical type progressive-power lens with a progressive refractive power action dividedly allotted to a first refractive surface being an object side surface and a second refractive surface being an eyeball side surface,

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wherein when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~nearsightedness~~ near vision diopter measurement position N1, are DHn and DVn respectively, the relation of DHn and DVn is expressed by,

$$DVn - DHn > ADD/2,$$

a surface astigmatism component at N1 of the first refractive surface is offset by the second refractive surface, and a combination of the first and second refractive surfaces gives a ~~nearsightedness~~ near vision diopter (Dn) based on prescription values.

10. (Currently Amended) The bi-aspherical type progressive-power lens according to claim 9

wherein when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~farsightedness~~ far vision diopter measurement position F1, are DHf and DVf respectively, the relation of DHf and DVf is expressed by

$$DHf + DHn < DVf + DVn, \text{ and } DVn - DVf > ADD/2, \text{ and } DHn - DHf < ADD/2,$$

surface astigmatism components at F1 and N1 of the first refractive surface are offset by the second refractive surface, and a combination of the first and second refractive surfaces gives a ~~farsightedness~~ far vision diopter (Df) and an addition diopter (ADD) based on prescription values.

11. (Currently Amended) The bi-aspherical type progressive-power lens according to claim 9, wherein

said first refractive surface is bilaterally symmetrical with respect to one meridian passing through the ~~farsightedness~~ far vision diopter measurement position F1, said

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second refractive surface is bilaterally asymmetrical with respect to one meridian passing through a ~~farsightedness diopter~~far vision diopter measurement position F2 of said second refractive surface, and a position of a ~~nearsightedness diopter~~near vision diopter measurement position N2 on said second refractive surface is shifted inward to a nose by a predetermined distance.

12. (Currently Amended) The bi-aspherical type progressive-power lens according to claim 9, wherein

said first refractive surface is a rotation surface with one meridian passing through the ~~farsightedness diopter~~far vision diopter measurement position F1 as a generating line, the second refractive surface is bilaterally asymmetrical with respect to one meridian passing through a ~~farsightedness diopter~~far vision diopter measurement position F2 on the second refractive surface, and an arrangement of a ~~nearsightedness diopter~~near vision diopter measurement position N2 on the second refractive surface is shifted inward to a nose by a predetermined distance.

13. (Currently Amended) The bi-aspherical type progressive-power lens according to claim 9, wherein

on the first refractive surface, a sectional curve in the horizontal direction passing through the ~~farsightedness diopter~~far vision diopter measurement position F1 is not a perfect circle but has a predetermined refractive power change, and a sectional curve of a cross section in the vertical direction including a normal line at an arbitrary position on the sectional curve in the horizontal direction is substantially the same as a meridian passing through the ~~farsightedness diopter~~far vision diopter measurement position F1.

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14. (Currently Amended) The bi-aspherical type progressive-power lens according to claim 9, wherein

in a structure of a combination of the first and second refractive surfaces giving the ~~farsightedness diopter~~ far vision diopter (Df) and the addition diopter (ADD) based on the prescription values and providing as necessary a prism refractive power (Pf), an aspherical correction is performed to at least one or more items of occurrence of astigmatism and a diopter error and occurrence of distortion of an image in a peripheral visual field, due to the fact that the sight line in a wearing state and a lens surface can not intersect at right angles.

15. (Currently Amended) A method of designing a bi-aspherical type progressive-power lens with a progressive refractive power action dividedly allotted to a first refractive surface being an object side surface and a second refractive surface being an eyeball side surface, wherein

when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~nearsightedness diopter~~ near vision ~~diometer~~ measurement position N1, are DHn and DVn respectively, the relation of DHn and DVn is expressed by

$$DVn - DHn > ADD/2,$$

and a surface astigmatism component at N1 of the first refractive surface is offset by the second refractive surface, and a combination of the first and second refractive surfaces gives a ~~nearsightedness diopter~~ near vision diopter (Dn) based on prescription values.

16. (Currently Amended) The method of designing a bi-aspherical type progressive-power lens according to claim 15, wherein

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when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~farsightedness diopter~~far vision diopter measurement position F1, are DHf and DVf respectively, the relation of DHf and DVf is expressed by

$$DHf + DHn < DVf + DVn, \text{ and } DVn - DVf > ADD/2, \text{ and } DHn - DHf < ADD/2,$$

surface astigmatism components at F1 and N1 of the first refractive surface are offset by the second refractive surface, and a combination of the first and second refractive surfaces gives a ~~farsightedness diopter~~far vision diopter (Df) and an addition diopter (ADD) based on prescription values.

17. (Currently Amended) The method of designing a bi-aspherical type progressive-power lens according to claim 15, wherein

said first refractive surface is bilaterally symmetrical with respect to one meridian passing through the ~~farsightedness diopter~~far vision diopter measurement position F1, the second refractive surface is bilaterally asymmetrical with respect to one meridian passing through a ~~farsightedness diopter~~far vision diopter measurement position F2 of the second refractive surface, and a position of a ~~nearsightedness diopter~~near vision diopter measurement position N2 on the second refractive surface is shifted inward to a nose by a predetermined distance.

18. (Currently Amended) The method of designing a bi-aspherical type progressive-power lens according to claim 15, wherein

said first refractive surface is a rotation surface with one meridian passing through the ~~farsightedness diopter~~far vision diopter measurement position F1 as a generating line, the second refractive surface is bilaterally asymmetrical with respect to one meridian passing

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through a ~~farsightedness diopter~~far vision diopter measurement position F2 on the second refractive surface, and a position of a ~~nearsightedness diopter~~near vision diopter measurement position N2 on the second refractive surface is shifted inward to a nose by a predetermined distance.

19. (Currently Amended) The method of designing a bi-aspherical type progressive-power lens according to claim 15, wherein

on the first refractive surface, a sectional curve in the horizontal direction passing through the ~~farsightedness diopter~~far vision diopter measurement position F1 is not a perfect circle but has a predetermined refractive power change, and a sectional curve of a cross section in the vertical direction including a normal line at an arbitrary position on the sectional curve in the horizontal direction is substantially the same as a meridian passing through the ~~farsightedness diopter~~far vision diopter measurement position F1.

20. (Currently Amended) The method of designing a bi-aspherical type progressive-power lens according to claim 15, wherein

in a structure of a combination of the first and second refractive surfaces giving the ~~farsightedness diopter~~far vision diopter (D_f) and the addition diopter (ADD) based on the prescription values and providing as necessary a prism refractive power (P_f), an aspherical correction is performed to at least one or more items of occurrence of astigmatism and a diopter error and occurrence of distortion of an image in a peripheral visual field, due to the fact that a sight line and a lens surface in a wearing state intersect at right angles.

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21. (Currently Amended) A bi-aspherical type progressive-power lens with a progressive refractive power action dividedly allotted to a first refractive surface being an object side surface and a second refractive surface being an eyeball side surface, wherein

when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~farsightedness diopter~~far vision diopter measurement position F1, are DHf and DVf respectively, and

on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~nearsightedness diopter~~near vision diopter measurement position N1, are DHn and DVn respectively, the relation of DHn and DVn is expressed by

$$DVn - DVf > ADD/2,$$

surface astigmatism components at F1 and N1 of the first refractive surface are offset by the second refractive surface, and a combination of the first and second refractive surfaces gives an addition diopter (ADD) based on prescription values, and

on a sectional curve in the vertical direction passing through F1, at an arbitrary position in a rectangle surrounded by two horizontal lines located at ± 4 mm in the vertical direction, with a position providing 50% of a change of a sectional diopter in the vertical direction ranging from F1 to the same height as N1 being the center, and two vertical lines located at ± 15 mm in the horizontal direction from a straight line in the vertical direction passing through F1,

a surface sectional diopter in the vertical direction on the first refractive surface has differential values such that the absolute value of a differential value in the vertical direction is larger than the absolute value of a differential value in the horizontal direction.

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22. (Currently Amended) A bi-aspherical type progressive-power lens with a progressive refractive power action dividedly allotted to a first refractive surface being an object side surface and a second refractive surface being an eyeball side surface, wherein

when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~farsightedness diopter~~far vision diopter measurement position F1, are DHf and DVf respectively, and

on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~nearsightedness diopter~~near vision diopter measurement position N1, are DHn and DVn respectively, the relation of DHn and DVn is expressed by

$$DVn - DVf > ADD/2,$$

surface astigmatism components at F1 and N1 of the first refractive surface are offset by the second refractive surface, and a combination of the first and second refractive surfaces gives an addition diopter (ADD) based on prescription values, and

on a sectional curve in the vertical direction passing through F1, at an arbitrary position in a rectangle surrounded by two horizontal lines located at ± 4 mm in the vertical direction, with a position providing 50% of a change of a sectional diopter in the vertical direction ranging from F1 to the same height as N1 being the center, and two vertical lines located at ± 15 mm in the horizontal direction from a straight line in the vertical direction passing through F1,

a surface astigmatism amount on the first refractive surface has differential values such that the absolute value of a differential value in the vertical direction is larger than the absolute value of a differential value in the horizontal direction, and

at an arbitrary position in the rectangle,

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a surface average diopter on the first refractive surface has differential values such that the absolute value of a differential value in the vertical direction is larger than the absolute value of a differential value in the horizontal direction.

23. (Currently Amended) A method of designing a bi-aspherical type progressive-power lens with a progressive refractive power action dividedly allotted to a first refractive surface being an object side surface and a second refractive surface being an eyeball side surface, wherein

when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~farsightedness diopter~~far vision diopter measurement position F1, are DHf and DVf respectively, and

on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~nearsightedness diopter~~near vision diopter measurement position N1, are DHn and DVn respectively, the relation of DHn and DVn is expressed by

$$DVn - DVf > ADD/2,$$

surface astigmatism components at F1 and N1 of the first refractive surface are offset by the second refractive surface, and a combination of the first and second refractive surfaces gives an addition diopter (ADD) based on prescription values, and

on a sectional curve in the vertical direction passing through F1, at an arbitrary position in a rectangle surrounded by two horizontal lines located at ± 4 mm in the vertical direction, with a position providing 50% of a change of a sectional diopter in the vertical direction ranging from F1 to the same height as N1 being the center, and two vertical lines located at ± 15 mm in the horizontal direction from a straight line in the vertical direction passing through F1,

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a surface sectional diopter in the vertical direction on the first refractive surface has differential values such that the absolute value of a differential value in the vertical direction is larger than the absolute value of a differential value in the horizontal direction

24. (Currently Amended) A method of designing a bi-aspherical type progressive-power lens with a progressive refractive power action dividedly allotted to a first refractive surface being an object side surface and a second refractive surface being an eyeball side surface, wherein

when on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~farsightedness diopter~~ far vision diopter measurement position F1, are DHf and DVf respectively, and

on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a ~~nearsightedness diopter~~ near vision diopter measurement position N1, are DHn and DVn respectively, the relation of DHn and DVn is expressed by

$$DVn - DVf > ADD/2,$$

surface astigmatism components at F1 and N1 of the first refractive surface are offset by the second refractive surface, and a combination of the first and second refractive surfaces gives an addition diopter (ADD) based on prescription values, and

on a sectional curve in the vertical direction passing through F1, at an arbitrary position in a rectangle surrounded by two horizontal lines located at ± 4 mm in the vertical direction, with a position providing 50% of a change of a sectional diopter in the vertical direction ranging from F1 to the same height as N1 being the center, and two vertical lines located at ± 15 mm in the horizontal direction from a straight line in the vertical direction passing through F1, a surface astigmatism amount on the first refractive surface has

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differential values such that the absolute value of a differential value in the vertical direction is larger than the absolute value of a differential value in the horizontal direction, and

at an arbitrary position in the rectangle,

a surface average diopter on the first refractive surface has differential values such that the absolute value of a differential value in the vertical direction is larger than the absolute value of a differential value in the horizontal direction.